

CLAIMS

What is claimed:

1. A hydrophilic superabsorbent polymer comprising
 - 5 a) from about 55 to about 99.9 wt.% of polymerizable unsaturated acid group containing monomers;
 - b) from about 0.001 to about 5.0 wt.% of internal crosslinking agent;
 - c) from about 0.001 to about 5.0 wt.% of surface crosslinking agent applied to the particle surface; and
 - 10 d) wherein the composition has a degree of neutralization of more than about 20%, and from about 20 mole % to about 75 mole % of the unsaturated acid group containing monomers are neutralized with a first neutralizing agent, and from about 5 mole % to about 40 mole % of the unsaturated acid group containing monomers are neutralized with a second neutralizing agent; at a 15 temperature of about 75°C or less;
- wherein the superabsorbent polymer has an absorption time of about $5+10 a^2$ minutes or greater, where a is the mean particle size of the superabsorbent material in millimeters, a liquid capacity of about 15 g/g or greater, a drop penetration value of about 2 seconds or less, and a $\frac{1}{2}$ float saturation of about 50% or less.
- 20 2. The superabsorbent polymer of Claim 1 having a liquid capacity of about 20 g/g or greater.
- 25 3. The superabsorbent polymer of Claim 1 having a liquid capacity of about 25 g/g or greater.

4. The superabsorbent polymer of Claim 1 having an Absorption Time of
about $7+10 a^2$ minutes or greater.

5. The superabsorbent polymer of Claim 1 having an Absorption Time of
about $10+10 a^2$ minutes or greater.

6. The superabsorbent polymer of Claim 1 having a Gel Bed Permeability of
about $20 \times 10^{-9} \text{ cm}^2$ or greater.

10 7. The superabsorbent polymer of Claim 1 having a Gel Bed Permeability of
about $50 \times 10^{-9} \text{ cm}^2$ or greater.

8. The superabsorbent polymer of Claim 1 having a Gel Bed Permeability of
about $80 \times 10^{-9} \text{ cm}^2$ or greater.

15 9. The superabsorbent polymer of Claim 1 wherein the first neutralizing
agent is selected from the group of monovalent hydroxides, carbonate or bicarbonate salts
and ammonia or mixtures thereof.

20 10. The superabsorbent of Claim 1 wherein at least 40% of the neutralization
is accomplished by the first neutralizing agent.

11. The superabsorbent polymer of Claim 1 wherein the first neutralizing
agent comprises a monovalent metal hydroxide.

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12. The superabsorbent polymer of Claim 1 wherein the second neutralizing agent comprises a multivalent metal hydroxide.

13. A water insoluble, slightly cross-linked, partially neutralized, hydrophilic, 5 superabsorbent polymer wherein the superabsorbent polymer has an absorption time of about $5+10 a^2$ minutes or greater, where a is the mean particle size of the superabsorbent material in millimeters, a liquid capacity of about 15 g/g or greater, a drop penetration value of about 2 seconds or less, and a $\frac{1}{2}$ float saturation of about 50% or less.

10 14. The superabsorbent polymer of Claim 13 having a liquid capacity of about 20 g/g or greater.

15. The superabsorbent polymer of Claim 13 having a liquid capacity of about 25 g/g or greater.

15 16. The superabsorbent polymer of Claim 13 having an Absorption Time of about $7+10 a^2$ minutes or greater.

17. The superabsorbent polymer of Claim 13 having an Absorption Time of 20 about $10+10 a^2$ minutes or greater.

18. The superabsorbent polymer of Claim 13 having a Gel Bed Permeability of about $20 \times 10^{-9} \text{ cm}^2$ or greater.

25 19. The superabsorbent polymer of Claim 13 having a Gel Bed Permeability of about $50 \times 10^{-9} \text{ cm}^2$ or greater.

20. The superabsorbent polymer of Claim 13 having a Gel Bed Permeability of about $80 \times 10^{-9} \text{ cm}^2$ or greater.

21. A hydrophilic superabsorbent polymer comprising

5 a) from about 55 to about 99.9 wt.% of polymerizable unsaturated acid group containing monomers;

 b) from about 0.001 to about 5.0 wt.% of internal crosslinking agent;

 c) from about 0.001 to about 5.0 wt.% of surface crosslinking agent applied to the particle surface; and

10 d) wherein the composition has a degree of neutralization of more than about 20%, and from about 20 mole % to about 75 mole % of the unsaturated acid group containing monomers are neutralized with a first neutralizing agent, and from about 5 mole % to about 40 mole % of the unsaturated acid group containing monomers are neutralized with a second neutralizing agent; at a

15 temperature of about 75°C or less.

22. The superabsorbent polymer of Claim 21 wherein the first neutralizing agent is selected from the group of monovalent hydroxides, carbonate or bicarbonate salts and ammonia or mixtures thereof.

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23. The superabsorbent of Claim 21 wherein at least 40% of the neutralization is accomplished by the first neutralizing agent.

24. The superabsorbent polymer of Claim 21 wherein the first neutralizing agent comprises a monovalent metal hydroxide.

25. The superabsorbent polymer of Claim 21 wherein the second neutralizing agent comprises a multivalent metal hydroxide.